



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **AHCIRG321A Operate low volume irrigation systems**

**Release: 1**

## **AHCIRG321A Operate low volume irrigation systems**

### **Modification History**

Not applicable.

### **Unit Descriptor**

This Unit covers the process of operating low volume irrigation systems and defines the standard required to: carry out pre-start checks; operate and monitor the system; measure and interpret flow rates and pressures; identify environmental hazards; and shut down in response to irrigation indicators.

### **Application of the Unit**

This Unit applies to skilled workers in the food and fibre production and amenity horticulture industries, and is likely to be carried out under routine supervision within enterprise guidelines.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

Not applicable.

### **Employability Skills Information**

This Unit contains employability skills.

### **Elements and Performance Criteria Pre-Content**

Elements describe the essential outcomes of a Unit of Competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Carry out pre-start checks	1.1 Checks of water, power, fuel and lubricants ensure that all are available and the control system is operational 1.2 Pumps are primed, if necessary, and valves and controls are open or closed as directed 1.3 Pressure and flow testing equipment are calibrated and available as required 1.4 Other pre-start system checks are carried out in accordance with manufacturer's requirements and enterprise procedures
2 Inspect and operate the system	2.1 Start up sequence is implemented in accordance with enterprise procedures 2.2 Emitter spacing is checked against the irrigation plan 2.3 Water pressure is adjusted as required 2.4 Filters are kept clear and replaced as required 2.5 All malfunctions, leaks and blockages are corrected or repaired immediately and reported in accordance with enterprise procedures
3 Monitor <i>low volume irrigation system</i> performance	3.1 Emitters are checked for output 3.2 Application rate of water is calculated 3.3 The water distribution pattern in the irrigated area is checked 3.4 Moisture levels in the root zone are monitored 3.5 Environmental impacts of the operation are minimised
4 Shut down irrigation system	4.1 Water is applied for sufficient time to achieve required soil moisture levels in accordance with irrigation schedule, environmental considerations and allowing for weather conditions 4.2 <i>System components</i> are shut down and drained in accordance with manufacturer's specifications and enterprise procedures 4.3 Irrigation activities are recorded and reported in accordance with regulatory requirements and enterprise procedures

## Required Skills and Knowledge

This section describes the skills and knowledge required for this Unit.

### Required skills include:

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#### Ability to:

- read and follow operations manual and procedures
- start up system and carry out operational checks
- monitor system effectiveness
  - application rates
  - irrigation times
  - emitter output
  - pressure variations and blockages
  - salinity levels and water quality
  - depth of irrigation
- measure and interpret flow rates and pressures
- perform shut down procedures
- assess soil moisture levels
- carry out measurements for output and distribution
- record data.

### Required knowledge includes:

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#### Knowledge of:

- principles of irrigation and the water cycle
- general irrigation methods for low volume systems
- main components of low volume irrigation systems
- pump types used in low volume irrigation systems and their operation
- shutdown sequence and flushing procedures
- energy efficiency indicators/ benchmarks for low volume irrigation
- soil characteristics
- soil/plant/water relationships
- water requirements of plants/crops consistent with sound environmental management
- critical measures for moisture availability
  - readily available water
  - water holding capacity
  - wilting point
  - field capacity
  - infiltration rates
  - evapotranspiration
- environmental impacts of irrigation using water from any ground or underground source.

## Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this Unit	<p>The evidence required to demonstrate competency in this Unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following:</p> <ul style="list-style-type: none"> <li>• carry out pre-start checks</li> <li>• operate and monitor the system</li> <li>• measure and interpret flow rates and pressures</li> <li>• identify environmental hazards</li> <li>• shut down in response to irrigation indicators.</li> </ul>
Context of and specific resources for assessment	<p>Competency requires the application of work practices under work conditions. Selection and use of resources for some worksites may differ due to the regional or enterprise circumstances.</p>

## Range Statement

The range statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<b><i>Low volume irrigation systems</i></b> may include:	systems that operate under comparatively low volume and pressure including micro irrigation, pop-ups at less than 0.1 litres/second, and drippers.
<b><i>System components</i></b> may include:	<ul style="list-style-type: none"> <li>• pump (flow rate and head requirement)</li> <li>• filter system</li> <li>• pressure gauges</li> <li>• backflow preventer</li> <li>• pressure regulator valves</li> <li>• fertiliser injector</li> <li>• flowmeter</li> <li>• block valve</li> <li>• air and vacuum release valves</li> <li>• main and sub-main lines</li> <li>• flushing manifold</li> <li>• connectors</li> <li>• lateral lines or tapes</li> <li>• emitters</li> <li>• controllers.</li> </ul>

## Unit Sector(s)

Irrigation